



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,157	10/30/2003	Hiroya Tanaka	8143/ETCH/DRIE/JB	1628

55649 7590 11/07/2005

MOSER IP LAW GROUP / APPLIED MATERIALS, INC.
1040 BROAD STREET
2ND FLOOR
SHREWSBURY, NJ 07702

EXAMINER

CHEN, KIN-CHAN

ART UNIT	PAPER NUMBER
----------	--------------

1765

DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/699,157	Applicant(s) TANAKA ET AL.	
	Examiner Kin-Chan Chen	Art Unit 1765	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>021704</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim Rejections - 35 USC § 102

2. Claims 1-3 and 7-8 are rejected under 35 U.S.C. 102(b) as being anticipated by Nishizawa (US 2002/0037648).

Nishizawa teaches a method of forming a damascene structure. A substrate having a feature defined through a first dielectric layer formed on a barrier layer such as a silicon carbide deposited on a metal wiring layer. A plasma may be generated from a gas mixture comprising CHF_3 . The barrier layer may be etched using the plasma to transfer the feature to the metal wiring layer. Nishizawa teaches the dielectric layer materials (claims 2 and 8). Nishizawa also teaches the gas mixture may further comprise gases such as nitrogen, oxygen and argon. See col. 3, lines 17-53; col. 6, lines 30-55.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 4-6 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nishizawa (US 2002/0037648) as evidenced by Demmin (US 6,635,185).

Nishizawa teaches a method of forming a damascene structure. A substrate having a feature defined through a first dielectric layer formed on a barrier layer such as a silicon carbide deposited on a metal wiring layer. A plasma may be generated from a gas mixture comprising CHF_3 . The barrier layer may be etched using the plasma to transfer the feature to the metal wiring layer. Nishizawa teaches the dielectric layer materials (claims 2 and 8). Nishizawa also teaches the gas mixture may further comprise gases such as nitrogen, oxygen and argon. See col. 3, lines 17-53; col. 6, lines 30-55.

The above-cited claims differ from Nishizawa by specifying various processing parameters (such as flow ratios of etching gases). However, same were known to be result-effective variables and commonly determined by routine experiment. The process of conducting routine experimentations so as to produce an expected result is obvious to one of ordinary skill in the art. In the absence of showing criticality or new,

Art Unit: 1765

unexpected results, a person having ordinary skill in the art would have found it obvious to modify the prior art by performing routine experiments to obtain optimal result with a reasonable expectation of success, see Demmin (US 6,635,185) in the record as evidence.

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Demmin (US 6,635,185; col. 7, lines 5-25) discloses that one skilled in the art of plasma etching and cleaning may vary type of plasma etching (RIE, HDP, plasma etching..), composition, flow rate, temperature, pressure, power, time, bias, accordingly to etch a desired material satisfactorily.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kin-Chan Chen whose telephone number is (571) 272-1461. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on (571) 272-1465. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For

Art Unit: 1765

more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

November 3, 2005

A handwritten signature in black ink, appearing to read 'K. Chen', with a stylized flourish extending to the right.

Kin-Chan Chen
Primary Examiner
Art Unit 1765